

all ages, from the lowest classes of infant schools to the evening classes for youths. Though considerations of space only permit particular reference to the section including the science exhibits from the schools of the Board, it may be said that the work shown from the manual training schools, the classes in domestic subjects, the institutions concerned with the physically and mentally defective, and from the classes in art subjects was highly creditable, and served admirably to show the extent and excellence of the work being done in the public elementary schools of the metropolis. The collection of pieces of apparatus to assist the teaching of science was this year much smaller than on previous occasions, the reason being that the offer of prizes for the most successful work was this year discontinued. It was satisfactory to notice that the plan recommended more than once in these columns was on this occasion carried out for the first time, and added much to the convenience of the visitor—we refer to the separation of the work of teachers and that of pupils. Judging from the exhibits, more attention appears to have been given during the past year to work with squared paper and to nature-study subjects, and there were some excellent relief maps made by boys of thirteen which would have been a credit to much older students. Altogether there is good reason to believe that the science work being done in the schools of the London Board, under the direction of Dr. Stewart and Messrs. Hubble and Todd, will lead to the development of habits of careful reasoning and alert observation.

SCIENTIFIC SERIAL.

American Journal of Science, April.—On the gaseous composition of the H and K lines of the spectrum, together with a discussion of reversed gaseous lines, by John Trowbridge. The continuous spectra observed in Geissler tubes when submitted to powerful disruptive sparks are not due to incandescence of the glass walls. The lines obtained coinciding closely with calcium lines, wave-lengths 3968 and 3933 are not due to calcium, but are true gaseous lines. The conclusion is drawn that the method of sifting out air lines from metallic spectra by observing the lines which are apparently common to these spectra and setting down such lines as air lines is a fallacious method.—The Boys radiometer, by C. C. Hutchins. The simplicity and sensitiveness of this instrument indicate its employment in several lines of work, but the difficulty of preparing the small circuit which forms its fundamental part is very great. Details are given of the methods suggested by the author of overcoming these difficulties.—Meteoric iron from N'Goureyima, near Djenne, Province of Macina, Soudan, by E. Cohen. This meteorite belongs to the comparatively rare group of coarsely granular irons, and presents peculiarities of structure which appear to be unique. More than 97 per cent. of it consists of nickeliferous iron, the remaining constituents being schreibserite, troilite, daubreelite, lawrencite, and chromite.—Notes on the collection of Triassic fishes at Yale, by G. F. Eaton.—The mechanics of igneous intrusion, by R. A. Daly. A comparison of the hypothesis of overhead stoping in the formation of magma chambers with the laccolithic theory of crustal displacement, and with the theory of marginal assimilation of invaded formations.—*Brachiosaurus altithorax*, the largest known Dinosaur, by E. S. Riggs.—Some new structural characters of Palaeozoic cockroaches, by E. H. Sellards.—The Bath furnace meteorite, by H. A. Ward. This meteorite fell on November 15, 1902, the date on which the orbit of the Leonids cuts that of the earth. The stone consists essentially of olivine and pyroxene, with troilite and metallic sprinklings. There is also present in small quantities a completely colourless, almost isotropic mineral, which is probably maskelynite.—The use of a rotating kathode in the electrolytic determination of the metals, by F. A. Gooch and H. E. Medway. An ordinary platinum crucible, rotated by a small electric motor at a speed of 600 to 800 revolutions per minute, is used as the kathode. Details of experiments with copper, nickel and silver are given, from which it would appear that much higher current densities may be employed than with the usual apparatus without any appreciable loss of accuracy.

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SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, April 22.—Prof. W. A. Tilden, F.R.S., president, in the chair.—The following papers were read:—The velocity and mechanism of the reaction between potassium ferricyanide and potassium iodide in neutral aqueous solution, by F. G. **Donnan** and R. **le Rossignol**. The velocity of this reaction can be investigated by titration of the iodine liberated; the simplest interpretation shows that it is quinquemolecular.—A microscopic method of comparing molecular weights, by G. **Barger**. Small quantities of the two solutions are introduced into a capillary tube, where they form bi-concave, discoid drops, care being taken to use the solutions alternately, so that each drop of one solution is enclosed between two drops of the other. The capillary tube is then sealed at both ends, and the length of each drop is measured microscopically from day to day until no change in volume is apparent. At this point the solutions are equimolecular.—Note on the spectrum of pilocarpine nitrate, by W. N. **Hartley**. The author states that the curve recently described by Dobbie as that of the ultra-violet absorption spectrum of pilocarpine nitrate is that of nitric acid slightly modified by the alkaloid present.—Isomeric change of dipropionanilide into propionyl-*p*-aminopropiophenone, by Dr. F. D. **Chattaway**. Under the influence of various catalytic reagents, e.g. zinc and hydrogen chlorides, dipropionanilide, like diacetanilide and dibenzanilide, undergoes transformation into propionyl-*p*-aminopropiophenone; the latter and some of its derivatives are described.—Note on the formation of di- and hexamethylammonio-cadmium chlorides, by W. R. **Lang**. Dry methylamine and cadmium chloride react at -11° to form a white powder of the composition $\text{CdCl}_2 \cdot 6\text{CH}_3\text{NH}_2$. This, when heated to 100° , furnishes a stable substance of the composition $\text{CdCl}_2 \cdot 2\text{CH}_3\text{NH}_2$.

Royal Astronomical Society, May 8.—Prof. H. H. Turner, president, in the chair.—The president announced that the council had elected Lady Huggins and Miss Agnes M. Clerke honorary members of the Society.—The secretary read a paper by the Rev. S. J. **Johnson** on a possible cause of the moon's obscurity on April 11, in which the author suggested that the presence of volcanic dust in the earth's atmosphere was the cause of the darkness of the moon's disc during the recent partial eclipse.—Mr. **Lewis** gave an account of a series of measures of double stars made with the 28-inch refractor at the Royal Observatory, Greenwich, during 1902, and described the orbits of some stars of especial interest.—Mr. Bryan **Cookson** gave a short account of his work on the satellites of Jupiter during a recent stay of two years at the Royal Observatory, Cape of Good Hope.—The Astronomer Royal exhibited and explained a series of diagrams of sun-spots and magnetic disturbance observed at the Royal Observatory during the years 1874 to 1901.—Dr. **Rambaut** read a paper on occultations of stars observed at the Radcliffe Observatory, Oxford, during the lunar eclipse, as well as observations of the colour of the shadow, penumbra, &c.—The president suggested certain subjects for discussion, and a short discussion took place on Mr. Percival Lowell's recent proposal of a standard scale of "seeing."—Mr. A. R. Hinks read extracts from a letter from Mr. **Ritchey**, of the Yerkes Observatory, in which he described his methods of developing photographs of nebulae, &c. Mr. Ritchey stated that with regard to such nebulae as those of Andromeda or Orion he made his prints from a negative in which the central portions had been reduced. He considered that the star images are smaller on a negative that had been developed extremely slowly.

Anthropological Institute, April 28.—Mr. H. Balfour, the president, exhibited specimens of the tools used by the natives of North-West Australia in the manufacture of glass spearheads. The tools consist of a piece of a sheep's leg-bone and of a water-worn pebble of a purely natural shape. The pebble was used in the earlier stages of the spearhead's manufacture, while the bone was used in its final shaping. Mr. Balfour also exhibited a spearhead which had been made with these tools. A full account of the exhibit, illustrated with a plate, will be found in the May number of

Man.—Mr. E. N. **Fallaize** read a paper on the classification of the subject-matter of anthropology. After defining anthropology quite generally as the "science of man," and pointing out how vast was the scope of such a science which must include all that man is and all that man does, Mr. Fallaize suggested the following classification of the questions with which the science has to deal:—A. Man's place in Nature, including under this head the investigation of man's place in time and man's place in space, the first section (for which the term palæanthropography was suggested) dealing with the origin and descent of man, Tertiary man, the physical types of the Stone, Bronze, and Iron ages; the second with the distribution of mankind, and the classification of races by physical types—general ethnology. Under B. fall all questions dealing with physical structure—anthropography; while C. deals with the functioning of the organs—physiological anthropology—including such questions as heredity, atavism, racial fertility, and the like. Section D. deals with specifically human activities in the following order:—(a) gratification of the senses, including dancing and the æsthetic arts; (b) gratification of the intellect, the sciences, especially in the earlier stages of their development; (c) communication of ideas, language and writing; (d) social structure, the individual and the social organism; (e) man's intercourse with Nature: (a) material nature—technology; (B) immaterial nature—the study of religion and folklore.—Mr. J. **Gray** read a paper on the measurements of the Colonial Coronation contingent. The paper contained an analysis of the measurements of about one hundred men of the native troops encamped at the Alexandra Palace during the Coronation celebrations. Amongst the races measured were natives of Sierra Leone and the West Coast of Africa, Nigeria, Lagos, Old Calabar, Central Africa and Somaliland; also Fijians, Maoris, Chinese and Singhalese. The mean values of the head dimensions and stature were calculated for each group, and also possible deviations from the mean in other samples. The results were plotted out on a chart, and the conclusions arrived at were that broadly the same race stretches from Sierra Leone to Somaliland, but that towards North Africa the breadth of the head increases. The Asiatic and Polynesian races, such as the Chinese, Fijians, and Maoris, were infallibly distinguished from the African races by the greater breadth of their heads. The measurements of the African races showed remarkably good agreement with Mr. Randall MacIver's measurements of the Berbers, and Sir H. Johnston's measurements of the Central Africans.

Zoological Society, April 21.—Dr. Henry Woodward, F.R.S., vice-president, in the chair.—Mr. Henry **Scherren** read a short paper dealing with the literature of feather-tracts as found in the writings of Hunter and Linnaeus. The author directed attention to a figure in the "Amœnitates" (1766) in which these tracts were shown, and suggested that a passage in "The Garden of Cyrus" proved that Sir Thomas Browne knew of them, and that they varied in extent and position in different birds.—Mr. Oldfield **Thomas** read a paper on some mammals collected by Captain H. N. Dunn in the Egyptian Soudan. Nineteen species were enumerated, of which five were described as new.—In a paper on the geographical distribution of the Mygalomorphæ, an order including the trapdoor spiders and the species formerly grouped together under the comprehensive title Mygale, Mr. R. I. **Pocock** pointed out that the known facts justified the mapping of the world into the following zoological regions:—(1) The Holarctic, including Europe north of the southern mountain chains, North Asia, and North America north of about the 45th parallel of latitude. (2) The Mediterranean, including South Europe, Africa north of the Sahara, and the desert regions of South-western Asia. (3) The Sonoran, including the United States of America south of about the 45th parallel of latitude and the plateau of Mexico. (4) The Ethiopian, including Africa south of the Sahara, South Arabia, and Madagascar. The last-mentioned island ranks merely as a subregion of the Ethiopian. (5) The Oriental, including India, Ceylon, Burma, Siam, and all the Indo- and Austro-Malayan Islands to Australia, "Wallace's line" being non-existent so far as spiders are concerned. (6) The Australian, including Australia and New Zealand, the latter being worthy of recognition as a subregion. (7) The Neo-

tropical, including Central America, apart from the Mexican plateau, the West Indies and South America. These spiders, moreover, furnished very strong evidence in favour of a former union between Africa and South America, and of a connection between the Afro-Mascarene and Austro-Zelandian continents on the one hand, and Austro-Zelandia and the southern extremity of South America on the other.—Mr. **Woodland** read a paper on the phylogenetic cause of the transposition of the testes in mammals.—A communication from Mr. F. F. **Laidlaw** dealt with the marine Turbellaria collected during the "Skeat Expedition" to the Malay Peninsula. In it ten new species were described, three of which were referred to new genera.

MANCHESTER.

Literary and Philosophical Society, April 21.—Mr. Charles Bailey, president, in the chair.—Mr. Spencer **Bickham** read a paper on caoutchouc, in which he described the methods of collection and preparation employed in the different countries where this product is obtained, and remarked upon the geographical distribution of the trees from which caoutchouc is extracted.

PARIS.

Academy of Sciences, May 4.—M. Albert Gaudry in the chair.—Notice on Admiral Ernest de Faulque de Jonquières, by M. E. **Guyou**.—Waves of the second order with respect to their velocity in vitreous media, possessing viscosity, and affected by finite movements, by M. P. **Duhem**.—On some physical properties of trimethylcarbinol, by M. de **Forcrand**. Determinations of the melting and boiling points, specific heat in the solid and liquid states, heat of fusion and volatilisation are given.—On glycuronic acid in the blood, by MM. R. **Lépine** and **Boulud**.—On the ancient lines of the Pliocene and Quaternary beaches on the French coasts of the Mediterranean, by M. Ch. **Depéret**. A preliminary study of the changes of level of the Mediterranean from the Pliocene epoch up to the present time. Four distinct lines of beach can be made out; the early Pliocene at an elevation of 170 to 175 metres, the recent Pliocene at an elevation of 60 metres, early Quaternary at an altitude of 25 metres, and a later Quaternary at an altitude of 4 to 5 metres. The hypothesis of a simple series of negative movements lowering the level of the sea is insufficient to explain these facts.—Remarks by M. Edmond **Perrier** on the sixth volume of his "Traité de Zoologie."—Secular perturbations, by M. Jean **Mascart**.—The period of the sun-spots and the mean annual temperature variations of the earth, by M. Charles **Nordmann**. The work of Köppen has shown that it is only in tropical stations that any connection can be traced between the mean annual temperature and the sun-spot frequency. A study of the observations made at twelve tropical stations shows that the mean annual temperature undergoes a variation the period of which is sensibly equal to that of the sun-spots. The effect of the spots is to diminish the mean terrestrial temperature, that is to say, the curve which represents the temperature variations is parallel to the inverse curve of the sun-spot frequency.—On the twilights observed at Bordeaux during the winter of 1902–1903, by M. **Esclangon**. The hypothesis of finely suspended dust being the cause of the phenomenon would appear to be insufficient. It is more probably due to clouds.—On the Γ function and its analogues, by M. A. **Pellet**.—On the approximation of numbers by rational numbers, by M. Emile **Borel**.—On the relative motion of the work and the tool in cutting the section of a mechanism, by M. G. **Koenigs**.—A transmission dynamometer giving directly the work in kilogrammetres, by MM. **Gaiffe** and **Günther**. An electrical contrivance by means of which the work can be directly read off on an ammeter. The apparatus can be easily arranged to be self-recording.—The theory of electric and magnetic dichroism, by M. Georges **Meslin**.—The repulsion of the anode light by the cathode rays, by M. **Salles**.—On metallic diaphragms, by M. Andre **Trochet**. If a plate of platinum is interposed between the two electrodes of a copper voltameter, when the current has attained a certain density, copper is deposited on the platinum. The dependence of this deposit upon the current and the shape of the bipolar electrode is studied quantitatively.—On compounds of aluminium

chloride possessing the function of a ferment, by M. G. **Gustavson**. A study of the action of the intermediate compounds formed in the Friedel and Crafts reaction.—On the action of phosphorous acid on erythrite, by M. P. **Carré**. Phosphorous acid acts towards erythrite as a less energetic dehydrating agent than phosphoric acid. Prolonged action gives a neutral phosphite of erythran, and this is immediately decomposed by water, the acid ester being formed.—Contribution to the study of organic acids, by MM. **Echsner de Coninck** and **Raynaud**. An examination of the relative stability of the lower members of the fatty acids towards hot concentrated sulphuric acid.—On the heat of formation of some barium compounds, by M. **Guntz**. Starting with metallic barium containing about 98.5 per cent. of the metal, the thermal changes associated with its solution in water and dilute hydrochloric acid have been determined, and the heat of oxidation of barium deduced.—On the chlorides of chlorocinnamylidene and bromocinnamylidene, by MM. Ernest **Charon** and Edgar **Dugoujon**.—The transformations of diphenylcarbonic esters and mono-salicylic esters, by M. R. **Fosse**.—On a new diiodophenol, by M. P. **Brenans**. A description of the mode of preparation, properties, and chief derivatives of the diiodophenol (OH):1:1,1:3:4.—On some new bases derived from the pentoses, by M. E. **Roux**. The new bases, arabinamine and xylamine, are prepared by the reduction of the oximes of arabinose and xylose.—The action of alkalis on glycerol. The application of the reaction to the estimation of glycerol, by M. A. **Buisine**. On heating potash lime with glycerol three different reactions may take place according to the temperature. At 320° the products are potassium acetate, potassium carbonate, water and hydrogen, and a method suitable for the estimation of small quantities of glycerol can be based on the measurement of the hydrogen.—On the existence of arsenic in the egg of the fowl, by M. Gab. **Bertrand**. All parts of the egg were found to contain appreciable amounts of arsenic. These results confirm the existence and probable function of arsenic in all living cells.—The influence of the radium rays on fertilised eggs, and on the first stages of development, by M. Georges **Bohn**.—On the formation of melanic pigment in the tumours of the horse, by M. C. **Gessard**. The abnormal production of black pigment in the healthy or morbid tissues of man is rare, but is very common in the horse. The chromogenic substance is tyrosine, the oxidation of which by tyrosinase which is present gives the colouring matter.—The law of action of trypsin on gelatin, by MM. Victor **Henry** and Languier **des Bancelis**. The action was followed by the changes produced in the electrical conductivity.—On the increase in weight in white mice, by Mlle. M. **Stephanowska**.—On a new secreting apparatus in the Coniferæ, by M. G. **Chauveaud**.—The development and anatomical structure of the seminal tegument in the Gentianaceæ, by M. Paul **Guerin**.—A respiratory hygrometer, by M. Pierre **Lesage**. A modified form of dew-point hygrometer. It has been found that the pressure of the water vapour in expired air does not correspond to the saturation pressure, and varies with state of the man.—The germination of the spores of truffles, the culture and characters of the mycelium, by M. Louis **Matruchot**.—On the echinitic fauna of the Gulf of Suez, by M. R. **Fourtau**.—On the closed basins of the Swiss Alps, by MM. Maurice **Lugeon**, Maurice **Ricklin**, and F. **Perriraz**.

DIARY OF SOCIETIES.

THURSDAY, MAY 14.

ROYAL SOCIETY, at 4.30.—The Combination of Hydrogen and Chlorine under the Influence of Light: P. V. Bevan.—On the Photo-Electric Discharge from Metallic Surfaces in Different Gases: Dr. W. Mansergh Varley.—The Elasmometer, a new Interferential Form of Elasticity Apparatus: A. E. Tutton, F.R.S.—Meteorological Observations by the Use of Kites off the West Coast of Scotland, 1902: Dr. W. N. Shaw, F.R.S., and W. H. Dines.—On the Radiation of Helium and Mercury in a Magnetic Field: Prof. A. Gray, F.R.S., and Dr. W. Stewart; with R. A. Houston and D. B. McQuistan.—A New Class of Organo-Tin Compounds containing Halogens: Prof. W. J. Pope, F.R.S., and S. J. Peachey.—The Xanthophyll Group of Yellow Colouring Matters: C. A. Schunck.

ROYAL INSTITUTION, at 5.—Proteid-Digestion in Plants: Prof. Sidney H. Vines, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—Generational Relations Defining an Abstract Simple Group of Order 32736: W. H. Bussey.—Points in the Theory of Continuous Groups: Dr. H. F. Baker.—On Fermat's Numbers: Lieut.-Col. Cunningham and Messrs. Western and Cullen.

SOCIETY OF ARTS, at 4.30.—The Province of Assam: Sir James Charles Lyall, K.C.S.I.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Applications of Electricity in Engineering and Shipbuilding Works: A. D. Williamson.—Electric Driving in Machine Shops: A. B. Chatwood.

FRIDAY, MAY 15

ROYAL INSTITUTION, at 9.—The Origin of Seed-Bearing Plants: D. H. Scott, F.R.S.

MONDAY, MAY 18.

SOCIETY OF ARTS, at 8.—Mechanical Road Carriages: W. Worby Beaumont.

TUESDAY, MAY 19.

ROYAL INSTITUTION, at 5.—The Astronomical Influence of the Tides: Prof. G. H. Darwin, F.R.S.

ROYAL STATISTICAL SOCIETY, at 5.—The Growth and Direction of our Foreign Trade in Coal during the Last Half Century: D. A. Thomas, M.P.

WEDNESDAY, MAY 20.

CHEMICAL SOCIETY, at 5.30.—Isomeric Partially Racemic Salts containing Quinquevalent Nitrogen. Part xi. Derivatives of *dl*-Methylhydriamine and *dl-neo*-Methylhydriamine. Isomeric Salts of the Type $\text{NR}_1\text{R}_2\text{H}_3$: G. Tattersall and F. S. Kipping.—The Conditions of Decomposition of Ammonium Nitrite: V. H. Veley.—Note on the Action of Methylamine on Chromic Chloride: W. R. Lang and E. H. Jolliffe.—The Action of Liquefied Ammonia on Chromium Chloride: W. R. Lang and C. M. Carson.—Cholesterol. A Preliminary Note: R. H. Pickard and J. Yates.

ROYAL MICROSCOPICAL SOCIETY, at 8.—Exhibition of Pond Life.

ROYAL METEOROLOGICAL SOCIETY, at 4.30.—The Relation of the Rain-fall to the Depth of Water in a Well: Charles P. Hooker.—The Frost of April, 1903: William Marriott.

THURSDAY, MAY 21.

ROYAL INSTITUTION, at 5.—Proteid-Digestion in Plants: Prof. S. H. Vines, F.R.S.

FRIDAY, MAY 22.

ROYAL INSTITUTION, at 9.—Dictionaries: Dr. J. A. H. Murray.

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